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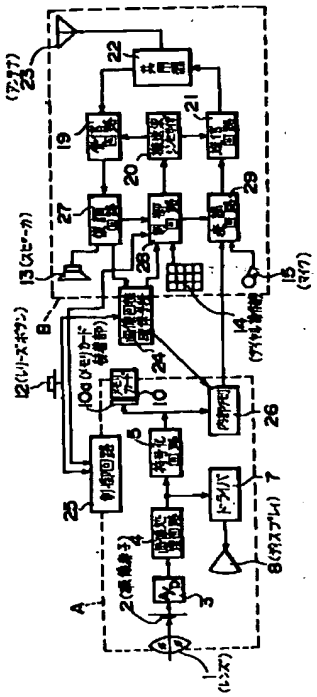
(54)【発明の名称】　携帯電話機能付電子スチルカメラ

(57)【要約】

【目的】　電子スチルカメラに携帯電話機能を搭載し、撮影した画像を電話回線を用いて即座に別の場所にある大型の記憶媒体に伝送可能に構成することにより即時性を改善する。また、撮影画像の確認用のディスプレイを着脱可能にすることによりカメラ全体の小形化を図る。

【構成】　レリーズボタン１２を半押しすると、カメラ部に電源が投入され制御回路２５は撮影のための制御を行う。被写体像はレンズ１，撮像素子２，画像処理回路４およびドライバ７を介してディスプレイ８に表示される。構図が決められレリーズボタン１２が押されると、画像データは内部メモリ２６に記録され、同時に画像回線確保手段２４が携帯電話機の制御回路２８に対し予め入力してある電話番号に発呼し回線を接続するように指示を出す。回線が接続されると、内部メモリ２６の画像データを読み出させる。制御回路２８はその画像データを変調回路２９，送信回路２１を介して回線に送出する。



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【特許請求の範囲】

【請求項1】　レンズ，撮像素子等よりなる画像入力手段，画像処理手段，画像符号化手段および画像記憶手段を有するディジタル電子スチルカメラに、電話の通話信号を無線送受信する携帯電話機能部を搭載し、

前記画像記憶手段の内部メモリの出力を前記携帯電話機能部の変調回路の入力に接続し、

前記電子スチルカメラは、レリーズボタンが押されたとき、カメラ部の電源を投入して前記画像入力手段より画像を入力して前記画像記憶手段の内部メモリに記憶した後、カメラ部の電源をオフ制御する制御手段を備え、

前記レリーズボタンが押されると同時に発呼し予め設定してある相手電話番号を送出し呼び出すように前記携帯電話機能部の制御手段を動作させ、回線が接続されたとき、前記内部メモリ内に記憶された画像データを読み出すように制御する画像回線確保手段を設け、

前記携帯電話機能部は、前記画像回線確保手段からの制御により回線が接続されたとき、前記内部メモリからの画像データを、接続された回線に送出し、送出終了によって回線を遮断するように制御し、回線が接続されない場合は、一定時間後再度回線接続の制御を行う制御部を備えたことを特徴とする携帯電話機能付電子スチルカメラ。

【請求項2】　ドライバ部およびディスプレイ部を備え、前記画像記憶手段のメモリカード装着部に装着可能な端子を有するとともに、前記ディスプレイ部の背面より外光を取り入れる構造を有するメモリカード形ディスプレイを用意し、

前記メモリカード装着部に前記ディスプレイを接続してファインダおよび再生画面として用いることを特徴とする請求項1記載の携帯電話機能付電子スチルカメラ。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、通話信号を無線で送受する携帯電話機を搭載した電子スチルカメラに関する。

【0002】

【従来の技術】近年電子スチルカメラは、回路の安定性などの理由からディジタル化が図られている。同様に外部記憶媒体においても画像の劣化がないことからメモリカードが用いられている。図10は従来のディジタル電子スチルカメラの一例を示す回路図である。図示しない被写体からの光はレンズ1によって撮像素子2上に結像される。撮像素子2の出力はA／D変換器3でディジタル信号に変換され、画像処理回路4で所定の処理が施される。画像処理回路4の画像データは圧縮され符号化される。符号化された画像データは復号化回路6で伸長処理がなされ、ドライバ7によってディスプレイ8に表示される。レリーズボタン12が押されると、その押下情報は制御回路11に伝達され、符号化された画像データはメモリカード10に記憶される。内部メモリ9は、例

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えばメモリカード10の容量が不足した場合に、撮影した画像を一時的に記憶し、交換した空き容量のあるメモリカードに撮影画像を記憶するために用いられる。

【0003】

【発明が解決しようとする課題】このようにメモリカードが外部記憶媒体として用いられているが、メモリカード内に記憶できる画像の枚数は少なく、しかもまだまだ高価であるという問題がある。また，近年カメラ，ビデオ等の撮影対象の観察および撮影画像の確認用のファインダ部は見やすさの点などから，液晶ディスプレイを用いることが多くなっている。しかしながら、液晶ディスプレイを用いることによりカメラ全体の形状が大きくなるという欠点がある。

【0004】そこで、本件発明者は上述の欠点を解決する手段としてメモリカードを装着してなくても、撮影可能にするために携帯電話機能を搭載することを考えた。図11は従来の携帯電話機の一例を示す回路図である。発信操作をし相手電話番号をダイヤル操作部14で入力すると、制御回路17は入力された電話番号を変調回路18を通して送信回路21に送出する。送信回路21では搬送波シンセサイザ20の搬送波に重畳され、共用器22，アンテナ23を介して送信される。相手と接続された旨の応答があると通話が可能となる。マイク15より入力される音声は変調回路18で所定の変調処理がなされ、送信回路21を経て相手側に送られる。一方、相手からの電波はアンテナ23，共用器22を介して受信回路19で受信される。受信回路19では搬送波成分が取り除かれ、復調回路16により復調される。復調された音声信号はスピーカ13より再生される。

【0005】本発明は、上記考察に基づくもので、その目的は、電子スチルカメラに携帯電話機能を搭載し、撮影した画像を電話回線を用いて即座に別の場所にある大型の記憶媒体に伝送可能に構成することにより、即時性を改善し、メモリカードの記憶枚数の少なさをフォローできる携帯電話機能付電子スチルカメラを提供することにある。本発明の他の目的は、上記電子スチルカメラにおいて、撮影対象の観察および撮影画像の確認用のディスプレイを着脱可能にすることによりカメラ全体の小形化を図った携帯電話機能付電子スチルカメラを提供することにある。

【0006】

【課題を解決するための手段】前記目的を達成するために本発明による携帯電話機能付電子スチルカメラは、レンズ，撮像素子等よりなる画像入力手段，画像処理手段，画像符号化手段および画像記憶手段を有するディジタル電子スチルカメラに、電話の通話信号を無線送受信する携帯電話機能部を搭載し、前記画像記憶手段の内部メモリの出力を前記携帯電話機能部の変調回路の入力に接続し、前記電子スチルカメラは、レリーズボタンが押されたとき、カメラ部の電源を投入して前記画像入力手

段より画像を入力して前記画像記憶手段の内部メモリに記憶した後、カメラ部の電源をオフ制御する制御手段を備え、前記レリーズボタンが押されると同時に発呼して予め設定してある相手電話番号を送出し呼び出すように前記携帯電話機能部の制御手段を動作させ、回線が接続されたとき、前記内部メモリ内に記憶された画像データを読み出すように制御する画像回線確保手段を設け、前記携帯電話機能部は、前記画像回線確保手段からの制御により回線が接続されたとき、前記内部メモリからの画像データを、接続された回線に送出し、送出終了によって回線を遮断するように制御し、回線が接続されない場合は、一定時間後再度回線接続の制御を行う制御部を備えて構成されている。さらに本発明は、他の目的を達成するためにドライバ部およびディスプレイ部を備え、前記画像記憶手段のメモリカード装着部に装着可能な端子を有するとともに、前記ディスプレイ部の背面より外光を取り入れる構造を有するメモリカード形ディスプレイを用意し、前記メモリカード装着部に前記ディスプレイを接続してファインダおよび再生画面として用いるように構成されている。

【０００７】

【作用】上記構成によれば、レリーズボタンを押すと同時に電源が投入されて被写体の画像が内部メモリに記憶されるとともに画像伝送用の回線の確保が行われ、回線が確保されると即座に画像の伝送が行われ、伝送終了とともに回線が遮断される。したがって、撮影者は高価で容量の多くないメモリカードなどの外部記憶媒体を携帯しなくても撮影が可能となり、上述の問題は解決される。また、ディスプレイを装着可能とすることにより携帯電話機能を搭載した分だけ大きくなりがちな電子スチルカメラの小形化を実現できる。

【０００８】

【実施例】以下，図面を参照して本発明をさらに詳しく説明する。図1は、本発明による携帯電話機能付電子スチルカメラの実施例を示す回路図である。図において、点線で囲まれたA部分は図１０のディジタル電子スチルカメラの回路部に、B部分は図１１の携帯電話機の回路部にそれぞれ対応する機能部であり、同じ符号を付してある各要素は同じ機能を果たす部分である。ディジタル電子スチルカメラの制御回路２５は、レリーズボタン１２の半押し下げによりカメラ部の電源を投入した後、全押し下げによって撮影操作に伴う制御を行う。画像回線確保手段２４はレリーズボタン１２の押下情報を得ると、携帯電話機の発呼，ダイヤル送出，回線接続動作を行わせるための制御情報を携帯電話機能部の制御回路２８に送出する。そして、復調回路２７より回線接続情報を得ると、ディジタル電子スチルカメラの内部メモリ２６に対し、画像データの読み出しを指示する。内部メモリ２６の読み出し画像データの出力端子は携帯電話機能部の変調回路２９の入力端子に接続されている。

【０００９】図2は、本発明による携帯電話機能付電子スチルカメラの外観の一例を説明するための図で、（ａ）は当該カメラの外観斜視図，（ｂ）は使用者がカメラを保持している状態をそれぞれ示している。本体２５の前面上部にスピーカ１３が、前面下部にマイク１５がそれぞれ配置され、上面にアンテナ２３とレンズ1が設けられている。前面のほぼ中央部にディスプレイ８が、その下側にレリーズボタン１２が，さらにその下側にダイヤル１４が配置されている。撮影する場合、（ａ）に示すように左手で把持し、図示しない被写体に対しレンズを向け、右手でレリーズボタン１２を半押し状態にすると、カメラ部に電源が投入されてディスプレイ８に被写体像が表示される。ディスプレイ８を見ながら構図を決め、撮影および撮影画像伝送のためにレリーズボタン１２を押し切ることとなる。電話をする場合は、（ａ）の状態でダイヤル操作部１４の発信ボタンを押しプッシュボタンで相手電話番号を入力することにより、スピーカ１３およびマイク１５によって通話することができる。

【００１０】図3は、本発明による携帯電話機能付電子スチルカメラの動作シーケンスを説明するためのフローチャートである。レリーズボタン１２を半押し状態にしてカメラ部の電源を投入する（ステップ「以下、ＳＴと記す」１，２）と、制御回路２５は、レンズ1によって撮像素子２上に結像された被写体の像をＡ／Ｄ変換器３でディジタル信号に変換し、画像処理回路４でＡＧＣ，γ補正等の画像処理を行った後、ドライバ７を介してディスプレイ８上に表示する（ＳＴ３，４）。構図を決めてレリーズボタン１２を押し切る（ＳＴ５）と、符号化回路５で符号化して内部メモリ２６に記録し（ＳＴ６）、内部メモリ２６など必要最少限の回路を残してカメラ部のパワーはオフする（ＳＴ７）。制御回路２５は上記動作と同時に一括転送モードに設定されているか否かを判定し（ＳＴ８）、一括転送モードに設定されていない場合は画像回線確保手段２４に対し、携帯電話機能部の制御回路２８に発呼を行うように指示する（ＳＴ９）。ここで一括転送モードとは、撮影者が所定枚数撮影し内蔵メモリに記録しておいてから一括して転送するモードであり、図示しない設定スイッチにより撮影者が予め設定できるモードである。

【００１１】一方、一括転送モードに設定されている場合は、メモリカード（装着されている場合）１０および内部メモリ２６の空き容量をチェックする（ＳＴ１４）。そして、空き容量がｎ（図示しない設定スイッチによりｎを変えることができる）枚以下であるか否かを判定する（ＳＴ１５）。ｎ枚より多い場合は伝送は行わず終了する。ｎ枚より少ない場合はＳＴ９の動作に戻ることとなる。制御回路２８は、予めダイヤル操作部１４のプッシュボタンによって入力されている伝送先電話番号を自回路内蔵メモリから読み出し、変調回路２９，送

信回路２１を介して送出し（ＳＴ１０）、回線が接続されるか否かを監視する（ＳＴ１１）。そして、相手が応答した旨の信号が回線より返送されてくると、その信号は受信回路１９で受信され復調回路２７で復調され、回線接続情報が制御回路２８および画像回線確保手段２４に入力する。画像回線確保手段２４は、この回線接続情報を受けることにより内部メモリ２６から画像データを読み出させる。読み出された画像データは、変調回路２９で変調され、送信回路２１で搬送波が重畳されてアンテナ２３より送出される（ＳＴ１２）。送信が終了すると、制御回路２８は回線を遮断し、着信待ち受け状態に必要な最少限度の回路を残して電源パワーを落す（ＳＴ１３）。

【００１２】相手が応答した旨の信号が回線より返送されず、回線が確保できないときは、相手がビジー状態（応答しない場合も含む）であるか否かを判断し（ＳＴ１６）、そうであるときはその旨をランプ等で表示する（ＳＴ１７）。相手がビジー状態ではないと判断したときは自体が電波送受信不可能な位置にいる旨をランプ等で表示する（ＳＴ１８）。上記いずれの場合も回線接続されないので、制御回路２８はつぎに制御回路２５を介してメモリカード１０が装着されているか否かを判断することとなる（ＳＴ１９）。判断の結果、メモリカード１０が装着されていないときはその旨をディスプレイまたは音声等で撮影者に警告する（ＳＴ２０）。撮影者が警告にしたがってメモリカード１０を差し込んだ場合（ＳＴ２１）、または当初から装着されている場合は内部メモリ２６に記録されている画像データをメモリカード１０に転送させる（ＳＴ２２）。ついで、リトライモードに設定されているか否かをチェックする（ＳＴ２３）。リトライモードに設定されていなければ、その時点で送信のための操作は終了する。リトライモードに設定されていれば、制御回路２８は自回路に内蔵するタイマを起動し、他の回路部分の電源をオフする（ＳＴ２４）。

【００１３】そして、タイマが所定の時間経過すると、他の回路部分の電源をオンして再度発呼し内蔵メモリより伝送先電話番号を読み出す。そして、読み出した電話番号を変調回路２９，送信回路２１を介して回線に送出する（ＳＴ２５）。回線を確保できたか否かを判断した（ＳＴ２６）結果、回線が接続できれば、メモリカード１０より内部メモリ２６に画像データを転送させ（ＳＴ２７）、さらに内部メモリ２６より画像データを変調回路２９，送信回路２１を経て回線に送出し（ＳＴ１２）、送信を終了する（ＳＴ１３）。再度の発呼にもかかわらず、回線が接続されない場合は再度、ＳＴ２４に戻り内蔵タイマを起動して所定時間後に発呼する動作を繰り返す。

【００１４】なお、図３のフローチャートはレリーズボタン１２とは別に電源スイッチが設けられていて、この電源スイッチをオンすることより携帯電話機能部が待ち受け状態になっていることを前提としたものである。また、電話機能部用のディスプレイ部を特別に設けていないが、ディスプレイ８を兼用することも可能である。リトライモードについては、一括転送モードと同様、図示しない設定用スイッチを操作して選定することができる。リトライモードは１回目の発呼で接続されなかった場合、例えばつぎは３分後に、これによっても接続されなかった場合は５分後というようにつぎの発呼までの時間を延長する形式のモードである。また，上記動作シーケンスによって画像データは回線によって伝送してしまうものであるが、伝送しないで撮影当初からメモリカードに画像を記録するようにできるのは勿論である。

【００１５】さらに画像データの伝送の他に、復号器等を設けることにより他の所からの画像データを受信することも可能である。さらには、先に伝送した画像データを参照したい場合には、相手の記憶媒体を伝送路を通して制御し、その記録媒体から画像データを伝送させることも記憶媒体を回線制御できるように構成すれば可能である。２つの回線を使用可能に構成することにより通話しながら撮影，画像伝送も可能になる。また、回線のディジタル化により，１つの回線で音声情報と画像情報をパケット通信によって伝送することが可能となる。画像の撮影において、文字情報のように２値色データを用い、黒白の階調のみで充分な場合などがあり、かかる場合に合わせて撮影，画像処理，符号化できるように各回路を構成することも可能である。他の機能としてセルフタイマを用いたときには撮影までの残り時間を音声で知らせるようにすること、ＧＰＳ等の位置情報取得手段からデータを受け取ることにより、撮影場所、環境等の情報も付加して伝送する回路部分を設けることも可能である。

【００１６】図４は、本発明による携帯電話機能付電子スチルカメラの外観の他の例を説明するための図で、（ａ）はその外観斜視図である。図２のカメラボディの外観とは、レンズ，ファインダおよびレリーズボタンの設置位置が異なっている。レンズ３０は左側面に設けられ、ポップアップ形式になっている。ファインダ３２は右側面に設けられ、同様にポップアップ形式になっている。電子スチルカメラを使用していない場合は、レンズ３０およびファインダ３２とも本体内に収納される。レリーズボタン３１は右側面のファインダ３２の下部に設けられている。（ｂ）はファインダ３２の詳細図で、外部入射部３２ａから光が取り入れられ液晶ディスプレイ３２ｂのバックライトを省略している。（ｃ）および（ｄ）は電子スチルカメラを使用するときの把持状態を示すもので、左手で本体部を掴み左手の親指でレリーズボタン３１を押すことができ、片手で操作することができる。この形状は、マイク１５の突出部分に手の底があたり脇をしめやすく，固定しやすい。

【００１７】図５は本発明による携帯電話機能付電子スチルカメラの他の実施例を示す図で、（ａ）は外観斜視図，（ｂ）は使用状態を示す図である。本実施例は、携帯電話機を搭載したことにより大きくなりがちな電子スチルカメラを小形にしたもので、メモリカード装着部１０ａ（図１参照）にメモリカードの代わりにメモリカード形ディスプレイ３４を接続可能に構成したものである。（ａ）はメモリカード形ディスプレイ３４を本体上面前部に設けたメモリカード装着部１０ａに接続し、外光取入部としての鏡面板４１を開いた状態を示している。本体前面の上部にはスピーカ５０が、その下側にレリーズボタン４５が、さらにその下側にダイヤル操作部４４が配置されている。マイク４６は本体前面最下端に枢着されており、使用時には（ａ）に示すように展開され、使用しない状態ではダイヤル操作部４４およびレリーズボタン４５の上に折り畳んで収納される。この実施例では、回線が接続されない場合には内蔵メモリに記録された画像データをメモリカードに転送することができないので、メモリカード装着部１０ａに装着されたメモリカード形ディスプレイ３４を外してメモリカードを装着することとなる。

【００１８】図６は図５の実施例の回路構成図であり、図１と異なる回路構成部分のみを抜粋して示した回路図である。本回路は図１の回路において、ディスプレイ８とドライバ７を省略し、符号化回路５とメモリカード装着部１０ａとの間に選択回路４３を挿入し、後述するカード種識別ピンから情報により画像処理回路４の出力または符号化回路５の出力を選択するようにしたものである。メモリカードが装着された場合は符号化回路５の出力が、メモリカード形ディスプレイ３４が装着された場合は画像処理回路４の出力が接続される。図７は図５のメモリカード装着部の構造を説明するための斜視図である。メモリカード装着部はポップアップ形コネクタ４９になっており、未使用時には本体内に収容されており、使用時に上面の一部が跳ね上がりコネクタが現れる。メモリカード形ディスプレイ３４は図５（ａ）で示すような角度で差し込むことができる。図８（ａ）は図５のメモリカード形ディスプレイ３４の回路構成を示す図である。メモリカード用コネクタ４０の端子はコントローラ３９に接続され、コントローラ３９はＸドライバ３７とＹドライバ３８を駆動制御する。鏡面板４１からは拡散パネル３５を通ってＬＣＤ３６の背面に外光が入射する。図８（ｂ）はメモリカード形ディスプレイの外観斜視図である。

【００１９】図９は図５のメモリカード形ディスプレイ３４の構造を説明するための図である。（ａ）は鏡面板４１の展開状態を示す図，（ｂ）は液晶部分の構造を示す図である。ＬＣＤ３６の上に保護パネル５１が、下に拡散パネル３５が配置されている。接続端子部分の端には（ｃ）に示すようにカード種識別ピン４２が設けられている。このカード種識別ピン４２により本体側はメモリカード形ディスプレイ３４が装着されたことを認識することができ、選択回路４３によって切替えが可能である。このようにディスプレイを着脱式にすることにより、小形にできるとともに節電もできメモリカード形ディスプレイが破損した場合等は容易に交換できる。

【００２０】

【発明の効果】以上、説明したように、本発明によれば、撮影と同時に伝送の呼び出し回線を確保し、撮影した画像データを送出するように構成されているので、撮影枚数，使用メモリ容量をさほど気にせずに撮影することが可能となり、外部記憶媒体としてメモリカードの携帯を不要にする。したがって、まだまだ撮影枚数が少なく高価であるメモリカードを必ずしも携帯する必要はなくなる。撮影した画像データを伝送してしまうため、およびその形状からカメラとしてではなく，リモコンを使用する感覚で撮影することができる。また、撮影時のみカメラ部に電源が入り，終了とともに切れ、回線の確保に対しても不可能な場合、自動的に電源を落とすので、無駄な電力の使用を防止し、より長時間の使用を可能にする。さらにメモリカード装着部にメモリカードに代えてメモリカード形ディスプレイを脱着できる構造にした場合には、カメラ未使用のときはメモリカード形ディスプレイを外すことより、本体の小形化を実現でき、ディスプレイ自体故障などした場合でもディスプレイの交換が容易になる。ディスプレイ背面からの外光の入射構造であるので、節電の効果もある。

【図面の簡単な説明】

【図１】本発明による携帯電話機能付電子スチルカメラの実施例を示す回路図である。

【図２】図１の携帯電話機能付電子スチルカメラの外観の一例を示す図である。

【図３】本発明による携帯電話機能付電子スチルカメラの動作シーケンスを説明するためのフローチャートである。

【図４】図１の携帯電話機能付電子スチルカメラの外観の他の一例を示す図である。

【図５】本発明による携帯電話機能付電子スチルカメラの他の実施例を示す図で、（ａ）はメモリカード装着部に装着可能なメモリカード形ディスプレイの外観を示す斜視図，（ｂ）は使用状態を示す斜視図である。

【図６】図５の実施例の回路構成図である。

【図７】図５のメモリカード形ディスプレイの装着を説明するための斜視図である。

【図８】（ａ）は図５のメモリカード形ディスプレイ内の回路構成図，（ｂ）はその外観を示す斜視図である。

【図９】図５のメモリカード形ディスプレイのコネクタ部分の構成を説明するための斜視図である。

【図１０】従来の電子スチルカメラの基本的な構成図である。

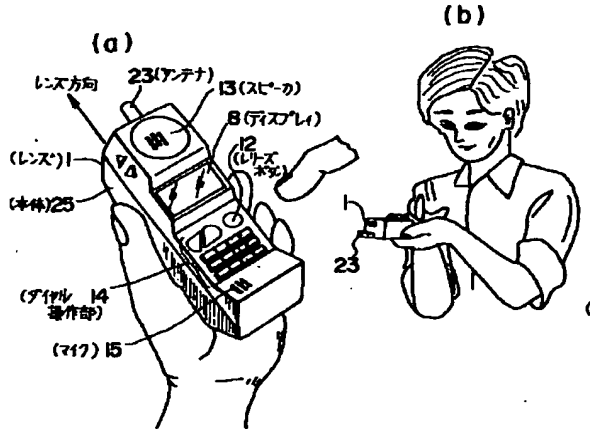
9　　10

【図１１】従来の携帯電話機の基本的な構成図である。

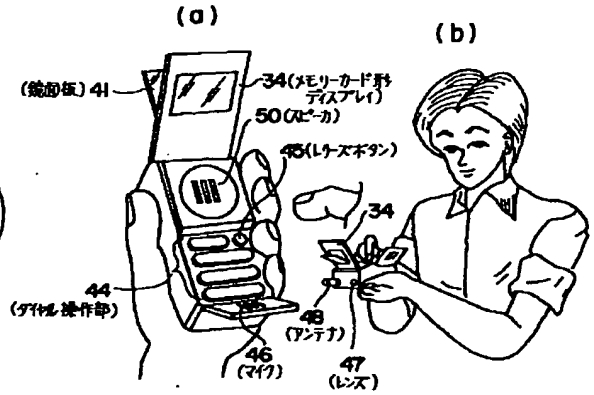
【符号の説明】

１，３０，４７　レンズ
２　固体撮像素子
３　Ａ／Ｄ変換器
４　画像処理回路
５　符号化回路
６　復号化回路
７　ドライバ
８　ディスプレイ
９，２６　内部メモリ
１０　メモリカード
１１，２５　制御回路
１２，３１，４５　レリーズボタン
１３，５０　スピーカ
１４，４４　ダイヤル操作部
１５，４６　マイク
１６，２７　復調回路
１７，２８　制御回路
１８，２９　変調回路
１９　受信回路
２０　搬送波シンセサイザ
２１　送信回路
２２　共用器
２３，４８　アンテナ
２４　画像回線確保手段
３２　ファインダ部
３４　メモリカード形ディスプレイ
３５　拡散パネル
３６　ＬＣＤ
３７　Ｘドライバ
３８　Ｙドライバ
３９　コントローラ
４０　メモリカード用コネクタ
４１　鏡面板
４２　カード種識別ピン
４３　選択回路

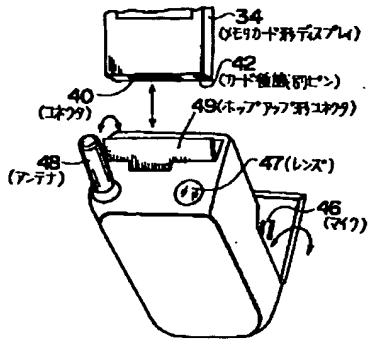
【図2】



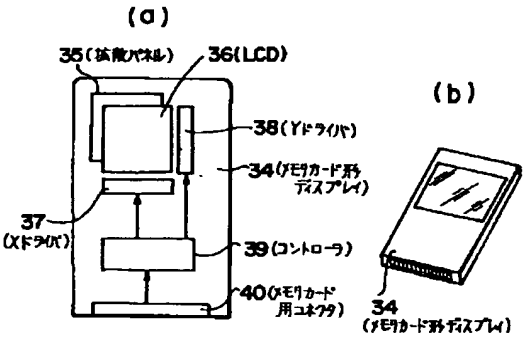
【図5】



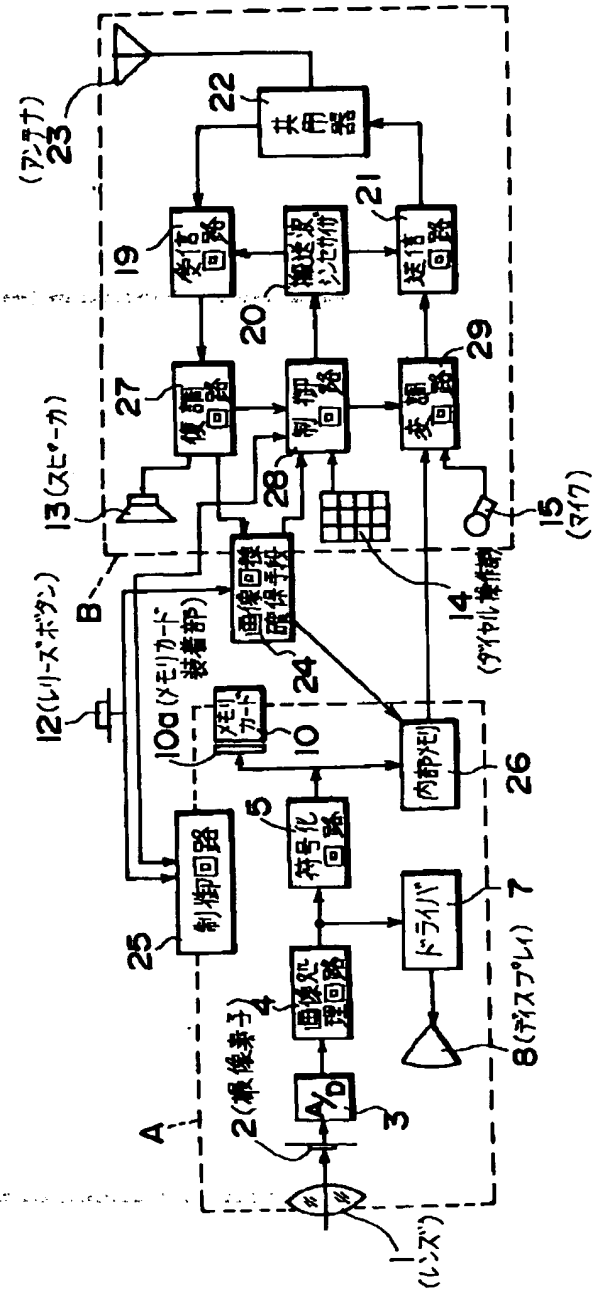
【図7】



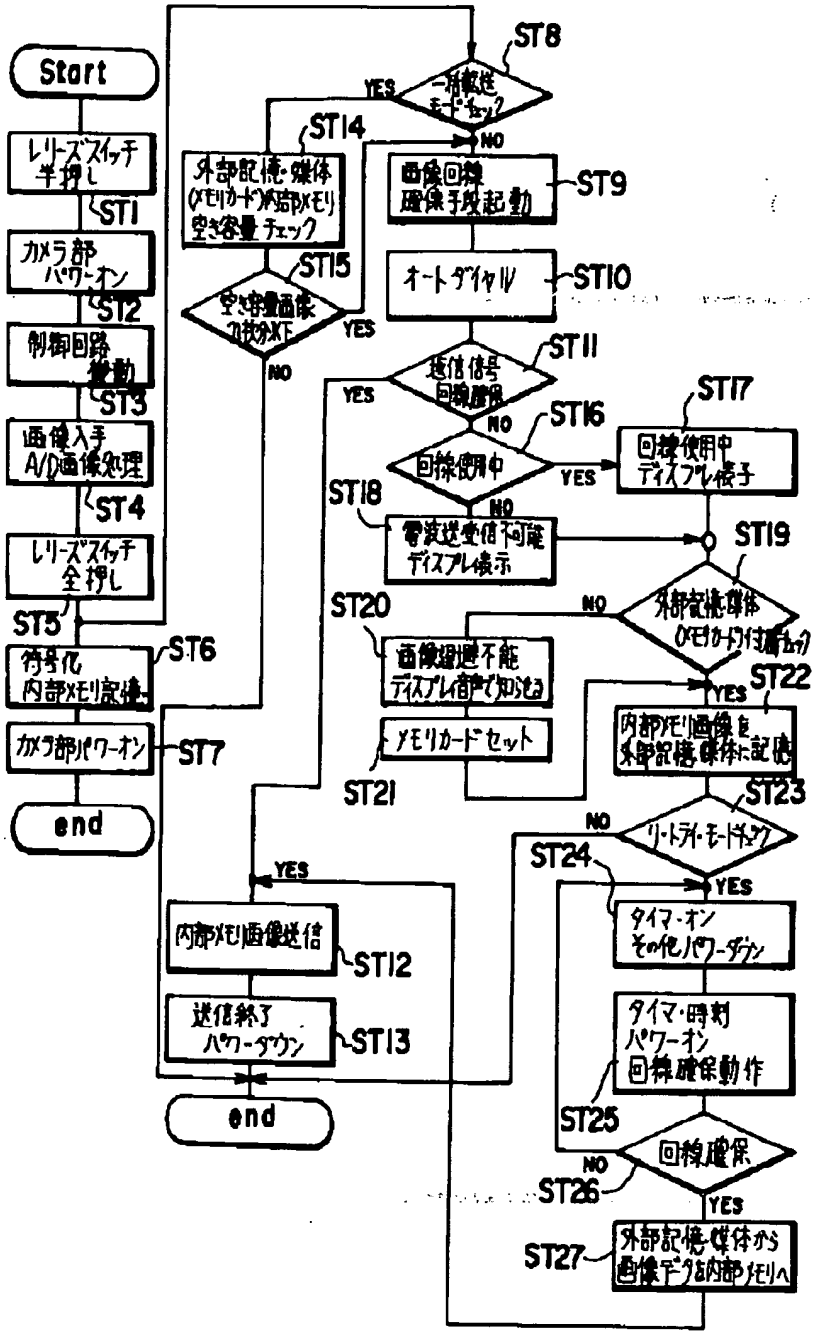
【図8】



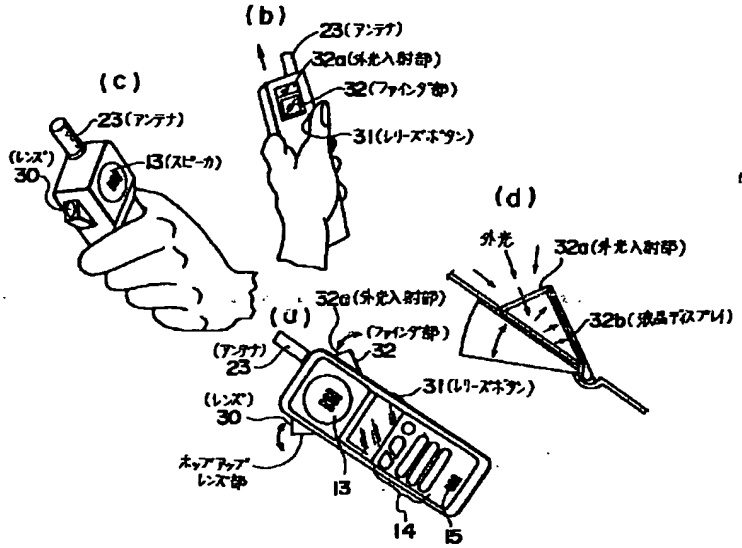
【図1】


(アンテナ)
23
22
共用器
21
19
受信回路
20
復調回路
27
29
変調回路
28
13(スピーカ)
15
(マイク)
B
12(レリーズボタン)
10a(メモリカード装着部)
メモリカード
10
24
14
(ダイヤル等操作部)
内部メモリ
26
5
符号化回路
25
制御回路
ドライバ
7
4
画像処理回路
8(ディスプレイ)
A
2(撮像素子)
3
1
(レンズ)

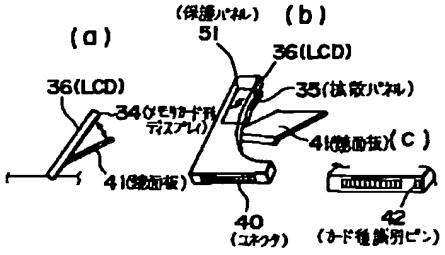
【図3】


Start
レリーズスイッチ半押し
ST1
カメラ部パワーオン
ST2
制御回路駆動
ST3
画像入手 A/D画像処理
ST4
レリーズスイッチ全押し
ST5
符号化 内部メモリ記憶
ST6
カメラ部パワーオン
ST7
end
ST8
一斉転送モードチェック?
YES
NO
ST14
外部記憶媒体(メモリカード)内部メモリ空き容量チェック
ST15
空き容量画像1枚分以下
YES
NO
画像回線確保手段起動
ST9
オートダイヤル
ST10
送信信号回線確保
ST11
YES
NO
回線使用中
ST16
YES
NO
回線使用中ディスプレ表示
ST17
電波送受信不可能ディスプレ表示
ST18
ST19
外部記憶媒体(メモリカード)付属チェック
NO
YES
ST20
画像選択不能ディスプレ音声で知らせる
メモリカードセット
ST21
ST22
内部メモリ画像を外部記憶媒体に記憶
ST23
リトライモードチェック
NO
YES
ST24
タイマオン その他パワーダウン
タイマ時刻パワーオン 回線確保動作
ST25
回線確保
NO
ST26
YES
外部記憶媒体から画像データ内部メモリへ
ST27
YES
内部メモリ画像送信
ST12
送信終了 パワーダウン
ST13
end

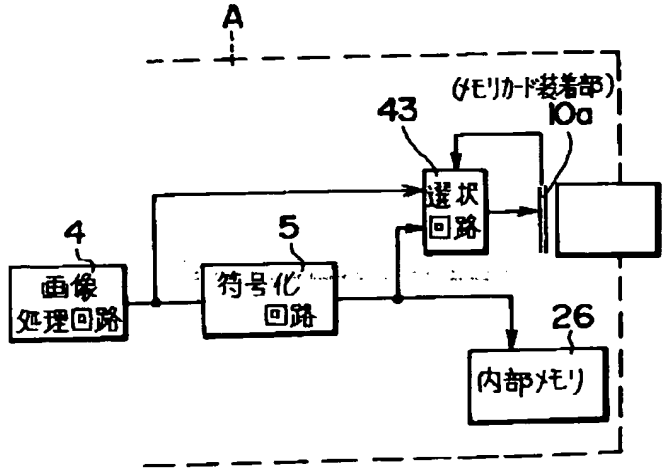
【図4】


(b)
23(アンテナ)
32a(外光入射部)
32(ファインダ部)
31(レリーズボタン)
(c)
23(アンテナ)
(レンズ)
30
13(スピーカ)
(d)
外光
32a(外光入射部)
32b(液晶ディスプレイ)
32a(外光入射部)
(d)
(アンテナ)
23
(ファインダ部)
32
31(レリーズボタン)
(レンズ)
30
ポップアップ
レンズ部
13
14
15

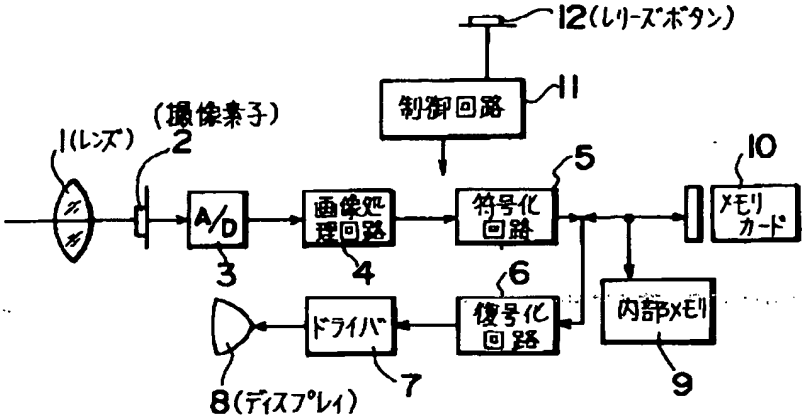
【図9】


(a)
(保護パネル)
51
(b)
36(LCD)
36(LCD)
35(拡散パネル)
34(メモリカード用
ディスプレイ)
41(導光板)
41(導光板)(c)
40
(コネクタ)
42
(カード種識別ピン)

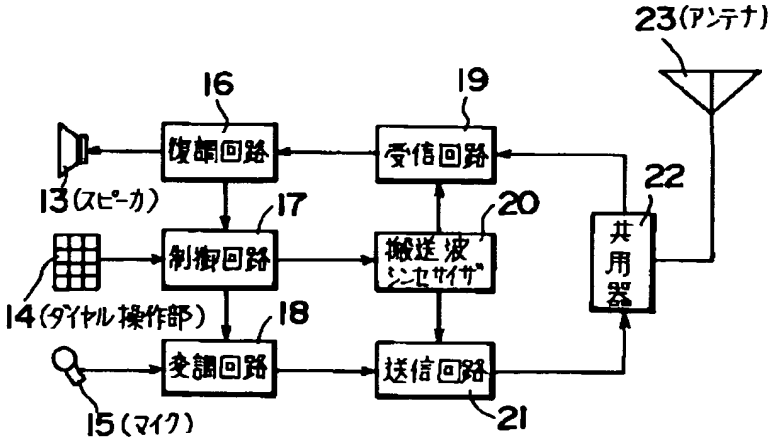
【図6】


A
(メモリカード装着部)
43
10a
選択回路
4
画像処理回路
5
符号化回路
26
内部メモリ

【図10】


12(レリーズボタン)
制御回路
11
(撮像素子)
1(レンズ)
2
A/D
3
画像処理回路
4
符号化回路
5
6
10
メモリカード
内部メモリ
9
復号化回路
ドライバ
7
8(ディスプレイ)

【図11】


23(アンテナ)
16
19
復調回路
受信回路
13(スピーカ)
17
20
22
制御回路
搬送波シンセサイザ
共用器
14(ダイヤル操作部)
18
変調回路
送信回路
15(マイク)
21

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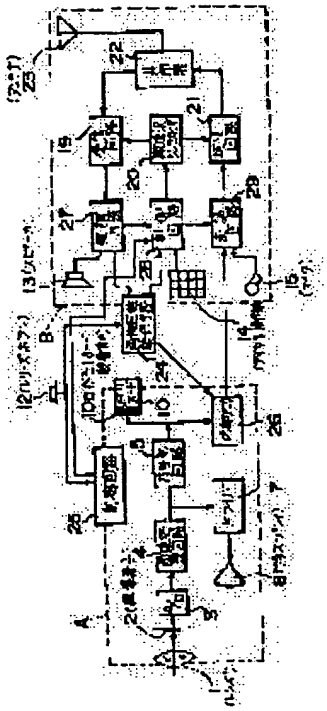
(71)Applicant : KYOCERA CORP

(72)Inventor : MORITA KUUGO

(54) ELECTRONIC STILL CAMERA WITH PORTABLE TELEPHONE FUNCTION

(57)Abstract:



PURPOSE: To improve instantaneity by loading a portable telephone function to an electronic still camera and constituting the camera to be capable of immediately transmitting a taken picture to a large storage medium at another place through the use of a telehone line and to miniaturize the whole camera by making a display for confirming the taken picture attachable and detachable.

CONSTITUTION: At the time of half-pushing a release button 12, power source is supplied to a camera part and a control circuit 25 controls for photographing. A subject is displayed on the display 8 through a lens 1, image pickup element 2, a picture processing circuit 4 and a driver 7. When a composition is decided and the release button 12 is pushed, picture data is recorded in an internal memory 26 and at the same time, a picture line ensuring means 24 instructs a control circuit 28 of the portable telephone set to call a previously-inputted telephone number to connect the line. When the line is connected, picture data of the internal memory 26 is read out. The control circuit 28 sends the piece of picture data to the line through a modulating circuit 29 and a transmission circuit 21.

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CLAIMS

[Claim(s)]
[Claim 1] An electronic "still" camera with a cellular-phone function characterized by providing or including the following To a digital electronic "still" camera which has an image input means which consists of a lens, an image sensor, etc., an image-processing means, an image coding means, and an image storage means A cellular-phone function part which carries out the wireless transmission and reception of the message signal of a telephone is carried, and an output of an internal memory of said image storage means is connected to an input of a modulation circuit of said cellular-phone function part. Said electronic "still" camera A control means which carries out off control of the power supply of the camera section after switching on a power supply of the camera section, inputting an image from said image input means and memorizing to an internal memory of said image storage means, when a release carbon button is pushed An image circuit secured means to control to read image data memorized in said internal memory when a control means of said cellular-phone function part is operated so that the partner telephone number which carries out call origination and which has been set up beforehand may be sent out and called and a circuit is connected at the same time said release carbon button is pushed Said cellular-phone function part is a control section which controls a line connection again after fixed time amount when a circuit is connected by control from said image circuit secured means, image data from said internal memory is sent out to a connected circuit, it controls to intercept a circuit by sending-out termination and a circuit is not connected.
[Claim 2] An electronic "still" camera with a cellular-phone function according to claim 1 characterized by preparing a memory card form display which has structure which takes in outdoor daylight, connecting said display to said memory card applied part, and using as a finder and a playback screen from the back of said display section while having the driver section and the display section and having a terminal with which a memory card applied part of said image storage means can be equipped.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the electronic "still" camera carrying the portable telephone which sends and receives a message signal on radio.
[0002]
[Description of the Prior Art] As for the electronic "still" camera, digitization is attained from the reasons of the stability of a circuit etc. in recent years. Since there is no deterioration of an image in external storage similarly, the memory card is used. Drawing 10 is the circuit diagram showing an example of the conventional digital electronic "still" camera. Image formation of the light from the photographic subject which is not illustrated is carried out on an image sensor 2 with a lens 1. The output of an image sensor 2 is changed into a digital signal with A/D converter 3, and predetermined processing is performed in the image-processing circuit 4. The image data of the image-processing circuit 4 is compressed and encoded. Expanding processing is made in the decryption circuit 6, and the encoded image data is displayed on a display 8 by the driver 7. If the release carbon button 12 is pushed, the depression information will be transmitted to a control circuit 11, and the encoded image data will be memorized by the memory card 10. When the capacity of a memory card 10 runs short, an internal memory 9 is used in order to memorize a photography image to a memory card with the availability which memorized the photoed image temporarily and exchanged them.
[0003]
[Problem(s) to be Solved by the Invention] Thus, although the memory card is used as external storage, there is little number of sheets of an image memorizable in a memory card, and it has the problem that it is moreover still expensive. Moreover, the finder section the observation for [, such as a camera and video,] photography and for the check of a photography image uses the liquid crystal display more often from the point of conspicuousness etc. in recent years. However, there is a defect that the configuration of the whole camera becomes large, by using a liquid crystal display.
[0004] Then, even if this artificer had not equipped with the memory card as a means to solve an above-mentioned defect, in order to make photography possible, he considered carrying a cellular-phone function. Drawing 11 is the circuit diagram showing an example of the conventional portable telephone. If submission operation is carried out and the partner telephone number is inputted by the dial control unit 14, a control circuit 17 sends out the inputted telephone number to a sending circuit 21 through a modulation circuit 18. In a sending circuit 21, the subcarrier of the subcarrier synthesizer 20 is overlapped and it is transmitted through the common machine 22 and an antenna 23. A message will become possible if there is a response of the purport connected with the partner. Modulation processing predetermined in a modulation circuit 18 is made, and the voice inputted from a microphone 15 is sent to the other party through a sending circuit 21. On the other hand, the electric wave from a partner is received through an antenna 23 and the common machine 22 in a receiving circuit 19. In a receiving circuit 19, a carrier component is removed and it gets over by the demodulator circuit 16. The sound signal to which it restored is reproduced from a loudspeaker 13.

[0005] Based on the above-mentioned consideration, by constituting the image which carried and photoed the cellular-phone function to the electronic "still" camera possible [transmission to the large-sized storage which is in somewhere else immediately using the telephone line], the purpose improves a sex instancy and this invention has it in offering the electronic "still" camera with a cellular-phone function which can follow up the little of the storage number of sheets of a memory card. Other purposes of this invention are in the above-mentioned electronic "still" camera by making removable the display the observation for photography, and for the check of a photography image to offer the electronic "still" camera with a cellular-phone function aiming at the miniaturization of the whole camera.

[0006]

[Means for Solving the Problem] In order to attain said purpose, an electronic "still" camera with a cellular-phone function by this invention To a digital electronic "still" camera which has an image input means which consists of a lens, an image sensor, etc., an image-processing means, an image coding means, and an image storage means A cellular-phone function part which carries out the wireless transmission and reception of the message signal of a telephone is carried, and an output of an internal memory of said image storage means is connected to an input of a modulation circuit of said cellular-phone function part. Said electronic "still" camera When a release carbon button is pushed, after switching on a power supply of the camera section, inputting an image from said image input means and memorizing to an internal memory of said image storage means, When it had a control means which carries out off control of the power supply of the camera section, a control means of said cellular-phone function part is operated so that the partner telephone number which carries out call origination and which has been set up beforehand may be sent out and called while said release carbon button was pushed, and a circuit is connected, An image circuit secured means to control to read image data memorized in said internal memory is established. Said cellular-phone function part When a circuit is connected by control from said image circuit secured means, image data from said internal memory When it sends out to a connected circuit, it controls to intercept a circuit by sending-out termination and a circuit is not connected, it has a control section which controls a line connection again after fixed time amount, and is constituted. While it has the driver section and the display section in order that this invention may furthermore attain other purposes, and having a terminal with which a memory card applied part of said image storage means can be equipped, it is constituted so that a memory card form display which has structure which takes in outdoor daylight may be prepared, said display may be connected to said memory card applied part and it may use as a finder and a playback screen from the back of said display section.

[0007]

[Function] According to the above-mentioned configuration, if reservation of the circuit for picture transmissions is performed and a circuit is secured while a power supply is switched on and the image of a photographic subject is memorized by the internal memory at the same time it pushes a release carbon button, transmission of an image will be performed immediately and a circuit will be intercepted with an end of transmission. Therefore, even if a photography person is expensive and does not carry external storage, such as a memory card which capacity does not have, photography of him is attained, and an above-mentioned problem is solved. Moreover, the miniaturization of the electronic "still" camera with which only the part which carried the cellular-phone function tends to become large is realizable by enabling wearing of a display.

[0008]

[Example] Hereafter, with reference to a drawing, this invention is explained in more detail. Drawing 1 is the circuit diagram showing the example of the electronic "still" camera with a cellular-phone function by this invention. In drawing, each element corresponding to the circuit section of the digital electronic "still" camera of drawing 10 in A portion surrounded by the dotted line which is a function part corresponding to the circuit section of the portable telephone of drawing 11 in B portion, respectively, and has attached the same sign is a portion which achieves the same function. The control circuit 25 of a digital electronic "still" camera performs control accompanying photography actuation by

all depression, after switching on the power supply of the camera section by half-depression of the release carbon button 12. The image circuit secured means 24 sends out the control information for making the call origination of a portable telephone, dial feed appearance, and line connection actuation perform to the control circuit 28 of a cellular-phone function part, if the depression information on the release carbon button 12 is acquired. And if line connection information is acquired from a demodulator circuit 27, read-out of image data is directed to the internal memory 26 of a digital electronic "still" camera. The output terminal of the read-out image data of an internal memory 26 is connected to the input terminal of the modulation circuit 29 of a cellular-phone function part.

[0009] Drawing 2 is drawing for explaining an example of the appearance of the electronic "still" camera with a cellular-phone function by this invention, and (a) is the appearance perspective diagram of the camera concerned, (b) shows the condition that the user holds the camera, respectively. A loudspeaker 13 is arranged in the front upper part of a main part 25, a microphone 15 is arranged at the front lower part, respectively, and the antenna 23 and the lens 1 are formed in the upper surface. a front face -- almost -- in the center section, the release carbon button 12 is arranged at the bottom, and the dial 14 is further arranged for the display 8 at the bottom. if it grasps with the left hand as shown in (a), and a lens is turned to the photographic subject which is not a drawing example and the release carbon button 12 is changed into a half-push condition with the right hand when taking a photograph, a power supply will be supplied to the camera section and a photographic subject image will be displayed on a display 8. Composition will be decided looking at a display 8 and the release carbon button 12 will be carried through for photography and photography picture transmission. When you telephone, and the dispatch carbon button of the dial control unit 14 is inputted in the condition of (a) and it inputs the partner telephone number by the push push button, it can talk over the telephone with a loudspeaker 13 and a microphone 15.

[0010] Drawing 3 is a flow chart for explaining the operating sequence of the electronic "still" camera with a cellular-phone function by this invention. the release carbon button 12 -- a half-push condition -- carrying out -- the power supply of the camera section -- supplying (1 step "it being hereafter described as ST" 2) -- after a control circuit 25 change into a digital signal the image of the photographic subject by which image formation be carried out on the image sensor 2 with A/D converter 3 and perform image processings, such as AGC and gamma amendment, with a lens 1 in the image processing circuit 4, it be displayed on a display 8 through a driver 7 (STs 3 and 4). composition -- deciding -- the release carbon button 12 -- forcing one's way (ST5) -- it encodes by the coding network 5, records on an internal memory 26 (ST6), it leaves circuits of the necessity minimum, such as an internal memory 26, and the power of the camera section is turned off (ST7). It judges whether the control circuit 25 is set as batch transfer mode by the above-mentioned actuation and coincidence (ST8), and when not set as batch transfer mode, it directs to perform call origination to the control circuit 28 of a cellular-phone function part to the image circuit secured means 24 (ST9). Since a photography person does predetermined number-of-sheets photography and records package transfer mode on the internal memory, it is the mode transmitted collectively and is the mode which a photography person can set up beforehand by the configuration switch which is not illustrated here.

[0011] On the other hand, when set as batch transfer mode, a memory card (when equipped) 10 and the availability of an internal memory 26 are checked (ST14). And it judges whether an availability is below n (n is changeable with configuration switch which is not illustrated) ** (ST15). When [than n sheets] more, transmission is not performed but it ends. When fewer than n sheets, it will return to actuation of ST9. A control circuit 28 reads the transmission place telephone number beforehand inputted by the push button of the dial control unit 14 from memory with a built-in self-circuit, and sends it out through a modulation circuit 29 and a sending circuit 21 (ST10), and it supervises whether a circuit is connected or not (ST11). And if the signal of the purport that the partner answered is returned from a circuit, it will be received in a receiving circuit 19, and will get over in a demodulator circuit 27, and line connection information will input the signal into a control circuit 28 and the image circuit secured means 24. The image circuit secured means 24 carries out reading appearance of the image data from an internal memory 26 by receiving this line connection information. It becomes irregular in a modulation circuit

29, and the image data by which reading appearance was carried out is superimposed on a subcarrier in a sending circuit 21, and is sent out from an antenna 23 (ST12). After transmission is completed, a control circuit 28 intercepts a circuit, leaves the circuit of whenever [required for waiting receptacle condition for arrival of the mail minimum], and drops power supply power (ST13).
[0012] When the signal of the purport that the partner answered is not returned from a circuit and a circuit cannot be secured, it judges whether a partner is a busy condition (it contains, also when not answering) (ST16), and comes out so, and that is displayed with a lamp etc. at a certain time (ST17). When a partner judges that it is not a busy condition, the very thing displays with a lamp etc. the purport which is present in the location in which electric wave transmission and reception are impossible (ST18). the above -- since the line connection of neither of the cases is carried out, a control circuit 28 will judge whether next, it is equipped with the memory card 10 through the control circuit 25 (ST19). As a result of decision, when not equipped with the memory card 10, it warns a photography person of that with a display or voice (ST20). When a photography person inserts a memory card 10 according to warning (ST21), or when being equipped from the beginning, the image data currently recorded on the internal memory 26 is made to transmit to a memory card 10 (ST22). Subsequently, it is confirmed whether it is set as retry mode (ST23). If not set as retry mode, the actuation for the transmission in the time is ended. If set as retry mode, a control circuit 28 starts the timer built in a self-circuit, and turns off the power supply of other circuit portions (ST24).
[0013] and time amount progress predetermined in a timer -- if it carries out, the power supply of other circuit portions will be turned on, call origination will be carried out again, and the transmission place telephone number will be read from an internal memory. And the read telephone number is sent out to a circuit through a modulation circuit 29 and a sending circuit 21 (ST25). If a circuit is connectable as a result of judging whether the circuit was securable (ST26), from a memory card 10, image data is made to transmit to an internal memory 26 (ST27), further, image data will be sent out to a circuit through a modulation circuit 29 and a sending circuit 21 from an internal memory 26 (ST12), and transmission will be ended (ST13). In spite of call origination for the second time, when a circuit is not connected, the actuation which starts a return internal timer to ST24, and carries out call origination after predetermined time again is repeated.
[0014] In addition, it is premised on the electric power switch being prepared independently [the release carbon button 12], and a cellular-phone function part awaiting the flow chart of drawing 3 from turning on this electric power switch, and being in a condition. Moreover, although the display section for telephone function parts is not prepared specially, it is also possible to make a display 8 serve a double purpose. About retry mode, the switch for a setup which is not illustrated can be operated and selected like package transfer mode. The next when retry mode is not connected by the 1st call origination is the mode of the format of extending the time amount to the next call origination, like after 5 minutes, when this does not connect after 3 minutes, either. Moreover, by the above-mentioned operating sequence, although image data is transmitted by the circuit, of course, an image can be recorded on a memory card from the time of photography without transmitting.
[0015] It is also possible to receive the image data from other places by forming a decoder etc. other than transmission of image data furthermore. Furthermore, it is possible to refer to the image data transmitted previously, if it constitutes so that controlling a partner's storage through a transmission line and also making image data transmit from the record medium can carry out line control of the storage. Photography and picture transmission also become possible, talking over the telephone by constituting two circuits usable. Moreover, digitization of a circuit enables it to transmit speech information and image information by packet communication by one circuit. In photography of an image, just monochrome gradation may be enough using binary color data like alphabetic information, and it is also possible photography, an image processing, and to constitute each circuit so that it can encode according to this case. When a self-timer is used as other functions, it is also possible by receiving data from positional information acquisition means, such as telling the residual time to photography with voice, and GPS, to prepare the circuit portion which also adds and transmits information, such as a photography location and environment.

[0016] Drawing 4 is drawing for explaining other examples of the appearance of the electronic "still" camera with a cellular-phone function by this invention, and (a) is the appearance perspective diagram. The installation location of a lens, a finder, and a release carbon button differs from the appearance of the camera body of drawing 2 . A lens 30 is formed in a left lateral and has become pop-up format. A finder 32 is formed in a right lateral and has become pop-up format similarly. When the electronic "still" camera is not being used, a lens 30 and a finder 32 are contained in a main part. The release carbon button 31 is formed in the lower part of the finder 32 of a right lateral. (b) is the detail drawing of a finder 32, and light is taken in from external incidence section 32a, and it is omitting the back light of liquid crystal display 32b. (c) And (d) shows the grasping condition when using an electronic "still" camera, can hold the main part section with the left hand, can push the release carbon button 31 with the left thumb, and can operate it single hand. The bottom of a hand hits a part for the lobe of a microphone 15, and this configuration tends to close the side, and tends to fix it.
[0017] Drawing 5 is drawing showing other examples of the electronic "still" camera with a cellular-phone function by this invention, and it is drawing in which (a) shows an appearance perspective diagram and (b) shows a busy condition. By having carried the portable telephone, this example is what was made small and constitutes the electronic "still" camera which tends to become large possible [connection of the memory card form display 34] instead of a memory card in memory card applied part 10a (refer to drawing 1). (a) connects the memory card form display 34 to memory card applied part 10a prepared in the upper surface anterior part of a main part, and shows the condition of having opened the mirror plane board 41 as outdoor daylight ******. The release carbon button 45 is arranged at the bottom, and the dial control unit 44 is further arranged for the loudspeaker 50 in the upper part of the front face of a main part at the bottom. The microphone 46 is pivoted in the front-face of main part lowest edge, and at the time of use, as shown in (a), it is developed, and it is folded up and contained on the dial control unit 44 and the release carbon button 45 in the condition of not using it. In this example, since the image data recorded on the internal memory cannot be transmitted to a memory card when a circuit is not connected, the memory card form display 34 with which memory card applied part 10a was equipped will be removed, and it will equip with a memory card.
[0018] Drawing 6 is circuitry drawing of the example of drawing 5 , and is the circuit diagram having extracted and shown only a different circuitry portion from drawing 1 . In the circuit of drawing 1 , this circuit omits a display 8 and a driver 7, and chooses the output of the image-processing circuit 4, or the output of a coding network 5 from the card kind discernment pin which inserts and mentions a selection circuitry 43 later between a coding network 5 and memory card applied part 10a using information. When are equipped with a memory card and the output of a coding network 5 is equipped with the memory card form display 34, the output of the image-processing circuit 4 is connected. Drawing 7 is a perspective diagram for explaining the structure of the memory card applied part of drawing 5 . The memory card applied part is the pop-up form connector 49, and it holds in the main part at the time of intact, and at the time of use, on top [a part of] leaps up, and a connector appears. The memory card form display 34 can be inserted at an angle as shown by drawing 5 (a). Drawing 8 (a) is drawing showing the circuitry of the memory card form display 34 of drawing 5 . The terminal of the connector 40 for memory cards is connected to a controller 39, and a controller 39 carries out drive control of the X driver 37 and the Y driver 38. From the mirror plane board 41, outdoor daylight carries out incidence to the back of LCD36 through the diffusion panel 35. Drawing 8 (b) is the appearance perspective diagram of a memory card form display.
[0019] Drawing 9 is drawing for explaining the structure of the memory card form display 34 of drawing 5 . Drawing in which (a) shows the expansion condition of the mirror plane board 41, and (b) are drawings showing the structure of a liquid crystal portion. A protective panel 51 is arranged on LCD36, and the diffusion panel 35 is arranged downward. As shown in (c), the card kind discernment pin 42 is formed in the edge of an end-connection child portion. It can recognize having been equipped with the memory card form display 34 by the main part side by this card kind discernment pin 42, and can change by the selection circuitry 43. Thus, by making a display into an attachment-and-detachment type, while being able to do small, when power saving is also completed and a memory card form

display is damaged, it can exchange easily.
[0020]
[Effect of the Invention] As mentioned above, according to this invention, as explained, the call circuit of transmission to photography and coincidence is secured, since it is constituted so that the photoed image data may be sent out, it becomes possible to take a photograph, without caring about photography number of sheets and use memory space so much, and carrying of a memory card is made unnecessary as external storage. It becomes unnecessary therefore, for photography number of sheets to not necessarily carry a few and expensive memory card still more. Since the photoed image data is transmitted, it is not as a camera from the configuration, and a photograph can be taken with the sensation which uses remote control. Moreover, since the camera section is turned on and it goes out with termination only at the time of photography, and a power supply is automatically dropped also to reservation of a circuit when impossible, use of useless power is prevented and use of long duration is enabled more. When it is made the structure which replaces with a memory card and can furthermore carry out desorption of the memory card form display to a memory card applied part, the miniaturization of a main part can be realized from removing a memory card form display at the time of camera un-using it, and exchange of a display becomes easy even when the display [itself] failure etc. is carried out. Since it is the incidence structure of the outdoor daylight from the display back, there is an effect of power saving.

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TECHNICAL FIELD

[Industrial Application] This invention relates to the electronic "still" camera carrying the portable telephone which sends and receives a message signal on radio.

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PRIOR ART

[Description of the Prior Art] As for the electronic "still" camera, digitization is attained from the reasons of the stability of a circuit etc. in recent years. Since there is no deterioration of an image in external storage similarly, the memory card is used. Drawing 10 is the circuit diagram showing an example of the conventional digital electronic "still" camera. Image formation of the light from the photographic subject which is not illustrated is carried out on an image sensor 2 with a lens 1. The output of an image sensor 2 is changed into a digital signal with A/D converter 3, and predetermined processing is performed in the image-processing circuit 4. The image data of the image-processing circuit 4 is compressed and encoded. Expanding processing is made in the decryption circuit 6, and the encoded image data is displayed on a display 8 by the driver 7. If the release carbon button 12 is pushed, the depression information will be transmitted to a control circuit 11, and the encoded image data will be memorized by the memory card 10. When the capacity of a memory card 10 runs short, an internal memory 9 is used in order to memorize a photography image to a memory card with the availability which memorized the photoed image temporarily and exchanged them.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Thus, although the memory card is used as external storage, there is little number of sheets of an image memorizable in a memory card, and it has the problem that it is moreover still expensive. Moreover, the finder section the observation for [, such as a camera and video,] photography and for the check of a photography image uses the liquid crystal display more often from the point of conspicuousness etc. in recent years. However, there is a defect that the configuration of the whole camera becomes large, by using a liquid crystal display.
[0004] Then, even if this artificer had not equipped with the memory card as a means to solve an above-mentioned defect, in order to make photography possible, he considered carrying a cellular-phone function. Drawing 11 is the circuit diagram showing an example of the conventional portable telephone. If submission operation is carried out and the partner telephone number is inputted by the dial control unit 14, a control circuit 17 sends out the inputted telephone number to a sending circuit 21 through a modulation circuit 18. In a sending circuit 21, the subcarrier of the subcarrier synthesizer 20 is overlapped and it is transmitted through the common machine 22 and an antenna 23. A message will become possible if there is a response of the purport connected with the partner. Modulation processing predetermined in a modulation circuit 18 is made, and the voice inputted from a microphone 15 is sent to the other party through a sending circuit 21. On the other hand, the electric wave from a partner is received through an antenna 23 and the common machine 22 in a receiving circuit 19. In a receiving circuit 19, a carrier component is removed and it gets over by the demodulator circuit 16. The sound signal to which it restored is reproduced from a loudspeaker 13.
[0005] Based on the above-mentioned consideration, by constituting the image which carried and photoed the cellular-phone function to the electronic "still" camera possible [transmission to the large-sized storage which is in somewhere else immediately using the telephone line], the purpose improves a sex instancy and this invention has it in offering the electronic "still" camera with a cellular-phone function which can follow up the little of the storage number of sheets of a memory card. Other purposes of this invention are in the above-mentioned electronic "still" camera by making removable the display the observation for photography, and for the check of a photography image to offer the electronic "still" camera with a cellular-phone function aiming at the miniaturization of the whole camera.

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MEANS

[Means for Solving the Problem] In order to attain said purpose, an electronic "still" camera with a cellular-phone function by this invention To a digital electronic "still" camera which has an image input means which consists of a lens, an image sensor, etc., an image-processing means, an image coding means, and an image storage means A cellular-phone function part which carries out the wireless transmission and reception of the message signal of a telephone is carried, and an output of an internal memory of said image storage means is connected to an input of a modulation circuit of said cellular-phone function part. Said electronic "still" camera When a release carbon button is pushed, after switching on a power supply of the camera section, inputting an image from said image input means and memorizing to an internal memory of said image storage means, When it had a control means which carries out off control of the power supply of the camera section, a control means of said cellular-phone function part is operated so that the partner telephone number which carries out call origination and which has been set up beforehand may be sent out and called while said release carbon button was pushed, and a circuit is connected, An image circuit secured means to control to read image data memorized in said internal memory is established. Said cellular-phone function part When a circuit is connected by control from said image circuit secured means, image data from said internal memory When it sends out to a connected circuit, it controls to intercept a circuit by sending-out termination and a circuit is not connected, it has a control section which controls a line connection again after fixed time amount, and is constituted. While it has the driver section and the display section in order that this invention may furthermore attain other purposes, and having a terminal with which a memory card applied part of said image storage means can be equipped, it is constituted so that a memory card form display which has structure which takes in outdoor daylight may be prepared, said display may be connected to said memory card applied part and it may use as a finder and a playback screen from the back of said display section.

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OPERATION

[Function] According to the above-mentioned configuration, if reservation of the circuit for picture transmissions is performed and a circuit is secured while a power supply is switched on and the image of a photographic subject is memorized by the internal memory at the same time it pushes a release carbon button, transmission of an image will be performed immediately and a circuit will be intercepted with an end of transmission. Therefore, even if a photography person is expensive and does not carry external storage, such as a memory card which capacity does not have, photography of him is attained, and an above-mentioned problem is solved. Moreover, the miniaturization of the electronic "still" camera with which only the part which carried the cellular-phone function tends to become large is realizable by enabling wearing of a display.

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EXAMPLE

[Example] Hereafter, with reference to a drawing, this invention is explained in more detail. Drawing 1 is the circuit diagram showing the example of the electronic "still" camera with a cellular-phone function by this invention. In drawing, each element corresponding to the circuit section of the digital electronic "still" camera of drawing 10 in A portion surrounded by the dotted line which is a function part corresponding to the circuit section of the portable telephone of drawing 11 in B portion, respectively, and has attached the same sign is a portion which achieves the same function. The control circuit 25 of a digital electronic "still" camera performs control accompanying photography actuation by all depression, after switching on the power supply of the camera section by half-depression of the release carbon button 12. The image circuit secured means 24 sends out the control information for making the call origination of a portable telephone, dial feed appearance, and line connection actuation perform to the control circuit 28 of a cellular-phone function part, if the depression information on the release carbon button 12 is acquired. And if line connection information is acquired from a demodulator circuit 27, read-out of image data is directed to the internal memory 26 of a digital electronic "still" camera. The output terminal of the read-out image data of an internal memory 26 is connected to the input terminal of the modulation circuit 29 of a cellular-phone function part.
[0009] Drawing 2 is drawing for explaining an example of the appearance of the electronic "still" camera with a cellular-phone function by this invention, and (a) is the appearance perspective diagram of the camera concerned, (b) shows the condition that the user holds the camera, respectively. A loudspeaker 13 is arranged in the front upper part of a main part 25, a microphone 15 is arranged at the front lower part, respectively, and the antenna 23 and the lens 1 are formed in the upper surface. a front face -- almost -- in the center section, the release carbon button 12 is arranged at the bottom, and the dial 14 is further arranged for the display 8 at the bottom. if it grasps with the left hand as shown in (a), and a lens is turned to the photographic subject which is not a drawing example and the release carbon button 12 is changed into a half-push condition with the right hand when taking a photograph, a power supply will be supplied to the camera section and a photographic subject image will be displayed on a display 8. Composition will be decided looking at a display 8 and the release carbon button 12 will be carried through for photography and photography picture transmission. When you telephone, and the dispatch carbon button of the dial control unit 14 is inputted in the condition of (a) and it inputs the partner telephone number by the push push button, it can talk over the telephone with a loudspeaker 13 and a microphone 15.
[0010] Drawing 3 is a flow chart for explaining the operating sequence of the electronic "still" camera with a cellular-phone function by this invention. the release carbon button 12 -- a half-push condition -- carrying out -- the power supply of the camera section -- supplying (1 step "it being hereafter described as ST" 2) -- after a control circuit 25 change into a digital signal the image of the photographic subject by which image formation be carried out on the image sensor 2 with A/D converter 3 and perform image processings, such as AGC and gamma amendment, with a lens 1 in the image processing circuit 4, it be displayed on a display 8 through a driver 7 (STs 3 and 4). composition -- deciding -- the release carbon button 12 -- forcing one's way (ST5) -- it encodes by the coding network 5, records on an internal

memory 26 (ST6), it leaves circuits of the necessity minimum, such as an internal memory 26, and the power of the camera section is turned off (ST7). It judges whether the control circuit 25 is set as batch transfer mode by the above-mentioned actuation and coincidence (ST8), and when not set as batch transfer mode, it directs to perform call origination to the control circuit 28 of a cellular-phone function part to the image circuit secured means 24 (ST9). Since a photography person does predetermined number-of-sheets photography and records package transfer mode on the internal memory, it is the mode transmitted collectively and is the mode which a photography person can set up beforehand by the configuration switch which is not illustrated here.

[0011] On the other hand, when set as batch transfer mode, a memory card (when equipped) 10 and the availability of an internal memory 26 are checked (ST14). And it judges whether an availability is below n (n is changeable with configuration switch which is not illustrated) ** (ST15). When [than n sheets] more, transmission is not performed but it ends. When fewer than n sheets, it will return to actuation of ST9. A control circuit 28 reads the transmission place telephone number beforehand inputted by the push button of the dial control unit 14 from memory with a built-in self-circuit, and sends it out through a modulation circuit 29 and a sending circuit 21 (ST10), and it supervises whether a circuit is connected or not (ST11). And if the signal of the purport that the partner answered is returned from a circuit, it will be received in a receiving circuit 19, and will get over in a demodulator circuit 27, and line connection information will input the signal into a control circuit 28 and the image circuit secured means 24. The image circuit secured means 24 carries out reading appearance of the image data from an internal memory 26 by receiving this line connection information. It becomes irregular in a modulation circuit 29, and the image data by which reading appearance was carried out is superimposed on a subcarrier in a sending circuit 21, and is sent out from an antenna 23 (ST12). After transmission is completed, a control circuit 28 intercepts a circuit, leaves the circuit of whenever [required for waiting receptacle condition for arrival of the mail minimum], and drops power supply power (ST13).

[0012] When the signal of the purport that the partner answered is not returned from a circuit and a circuit cannot be secured, it judges whether a partner is a busy condition (it contains, also when not answering) (ST16), and comes out so, and that is displayed with a lamp etc. at a certain time (ST17). When a partner judges that it is not a busy condition, the very thing displays with a lamp etc. the purport which is present in the location in which electric wave transmission and reception are impossible (ST18). the above -- since the line connection of neither of the cases is carried out, a control circuit 28 will judge whether next, it is equipped with the memory card 10 through the control circuit 25 (ST19). As a result of decision, when not equipped with the memory card 10, it warns a photography person of that with a display or voice (ST20). When a photography person inserts a memory card 10 according to warning (ST21), or when being equipped from the beginning, the image data currently recorded on the internal memory 26 is made to transmit to a memory card 10 (ST22). Subsequently, it is confirmed whether it is set as retry mode (ST23). If not set as retry mode, the actuation for the transmission in the time is ended. If set as retry mode, a control circuit 28 starts the timer built in a self-circuit, and turns off the power supply of other circuit portions (ST24).

[0013] and time amount progress predetermined in a timer -- if it carries out, the power supply of other circuit portions will be turned on, call origination will be carried out again, and the transmission place telephone number will be read from an internal memory. And the read telephone number is sent out to a circuit through a modulation circuit 29 and a sending circuit 21 (ST25). If a circuit is connectable as a result of judging whether the circuit was securable (ST26), from a memory card 10, image data is made to transmit to an internal memory 26 (ST27), further, image data will be sent out to a circuit through a modulation circuit 29 and a sending circuit 21 from an internal memory 26 (ST12), and transmission will be ended (ST13). In spite of call origination for the second time, when a circuit is not connected, the actuation which starts a return internal timer to ST24, and carries out call origination after predetermined time again is repeated.

[0014] In addition, it is premised on the electric power switch being prepared independently [the release carbon button 12], and a cellular-phone function part awaiting the flow chart of drawing 3 from turning on this electric power switch, and being in a condition. Moreover, although the display section for

telephone function parts is not prepared specially, it is also possible to make a display 8 serve a double purpose. About retry mode, the switch for a setup which is not illustrated can be operated and selected like package transfer mode. The next when retry mode is not connected by the 1st call origination is the mode of the format of extending the time amount to the next call origination, like after 5 minutes, when this does not connect after 3 minutes, either. Moreover, by the above-mentioned operating sequence, although image data is transmitted by the circuit, of course, an image can be recorded on a memory card from the time of photography without transmitting.

[0015] It is also possible to receive the image data from other places by forming a decoder etc. other than transmission of image data furthermore. Furthermore, it is possible to refer to the image data transmitted previously, if it constitutes so that controlling a partner's storage through a transmission line and also making image data transmit from the record medium can carry out line control of the storage. Photography and picture transmission also become possible, talking over the telephone by constituting two circuits usable. Moreover, digitization of a circuit enables it to transmit speech information and image information by packet communication by one circuit. In photography of an image, just monochrome gradation may be enough using binary color data like alphabetic information, and it is also possible photography, an image processing, and to constitute each circuit so that it can encode according to this case. When a self-timer is used as other functions, it is also possible by receiving data from positional information acquisition means, such as telling the residual time to photography with voice, and GPS, to prepare the circuit portion which also adds and transmits information, such as a photography location and environment.

[0016] Drawing 4 is drawing for explaining other examples of the appearance of the electronic "still" camera with a cellular-phone function by this invention, and (a) is the appearance perspective diagram. The installation location of a lens, a finder, and a release carbon button differs from the appearance of the camera body of drawing 2 . A lens 30 is formed in a left lateral and has become pop-up format. A finder 32 is formed in a right lateral and has become pop-up format similarly. When the electronic "still" camera is not being used, a lens 30 and a finder 32 are contained in a main part. The release carbon button 31 is formed in the lower part of the finder 32 of a right lateral. (b) is the detail drawing of a finder 32, and light is taken in from external incidence section 32a, and it is omitting the back light of liquid crystal display 32b. (c) And (d) shows the grasping condition when using an electronic "still" camera, can hold the main part section with the left hand, can push the release carbon button 31 with the left thumb, and can operate it single hand. The bottom of a hand hits a part for the lobe of a microphone 15, and this configuration tends to close the side, and tends to fix it.

[0017] Drawing 5 is drawing showing other examples of the electronic "still" camera with a cellular-phone function by this invention, and it is drawing in which (a) shows an appearance perspective diagram and (b) shows a busy condition. By having carried the portable telephone, this example is what was made small and constitutes the electronic "still" camera which tends to become large possible [connection of the memory card form display 34] instead of a memory card in memory card applied part 10a (refer to drawing 1). (a) connects the memory card form display 34 to memory card applied part 10a prepared in the upper surface anterior part of a main part, and shows the condition of having opened the mirror plane board 41 as outdoor daylight ******. The release carbon button 45 is arranged at the bottom, and the dial control unit 44 is further arranged for the loudspeaker 50 in the upper part of the front face of a main part at the bottom. The microphone 46 is pivoted in the front-face of main part lowest edge, and at the time of use, as shown in (a), it is developed, and it is folded up and contained on the dial control unit 44 and the release carbon button 45 in the condition of not using it. In this example, since the image data recorded on the internal memory cannot be transmitted to a memory card when a circuit is not connected, the memory card form display 34 with which memory card applied part 10a was equipped will be removed, and it will equip with a memory card.

[0018] Drawing 6 is circuitry drawing of the example of drawing 5 , and is the circuit diagram having extracted and shown only a different circuitry portion from drawing 1 . In the circuit of drawing 1 , this circuit omits a display 8 and a driver 7, and chooses the output of the image-processing circuit 4, or the output of a coding network 5 from the card kind discernment pin which inserts and mentions a selection

circuitry 43 later between a coding network 5 and memory card applied part 10a using information. When are equipped with a memory card and the output of a coding network 5 is equipped with the memory card form display 34, the output of the image-processing circuit 4 is connected. Drawing 7 is a perspective diagram for explaining the structure of the memory card applied part of drawing 5 . The memory card applied part is the pop-up form connector 49, and it holds in the main part at the time of intact, and at the time of use, on top [a part of] leaps up, and a connector appears. The memory card form display 34 can be inserted at an angle as shown by drawing 5 (a). Drawing 8 (a) is drawing showing the circuitry of the memory card form display 34 of drawing 5 . The terminal of the connector 40 for memory cards is connected to a controller 39, and a controller 39 carries out drive control of the X driver 37 and the Y driver 38. From the mirror plane board 41, outdoor daylight carries out incidence to the back of LCD36 through the diffusion panel 35. Drawing 8 (b) is the appearance perspective diagram of a memory card form display.

[0019] Drawing 9 is drawing for explaining the structure of the memory card form display 34 of drawing 5 . Drawing in which (a) shows the expansion condition of the mirror plane board 41, and (b) are drawings showing the structure of a liquid crystal portion. A protective panel 51 is arranged on LCD36, and the diffusion panel 35 is arranged downward. As shown in (c), the card kind discernment pin 42 is formed in the edge of an end-connection child portion. It can recognize having been equipped with the memory card form display 34 by the main part side by this card kind discernment pin 42, and can change by the selection circuitry 43. Thus, by making a display into an attachment-and-detachment type, while being able to do small, when power saving is also completed and a memory card form display is damaged, it can exchange easily.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the circuit diagram showing the example of the electronic "still" camera with a cellular-phone function by this invention.
[Drawing 2] It is drawing showing an example of the appearance of the electronic "still" camera with a cellular-phone function of drawing 1 .
[Drawing 3] It is a flow chart for explaining the operating sequence of the electronic "still" camera with a cellular-phone function by this invention.
[Drawing 4] It is drawing showing other examples of the appearance of the electronic "still" camera with a cellular-phone function of drawing 1 .
[Drawing 5] It is drawing showing other examples of the electronic "still" camera with a cellular-phone function by this invention, and the perspective diagram in which (a) shows the appearance of the memory card form display with which a memory card applied part can be equipped, and (b) are the perspective diagrams showing a busy condition.
[Drawing 6] It is circuitry drawing of the example of drawing 5 .
[Drawing 7] It is a perspective diagram for explaining wearing of the memory card form display of drawing 5 .
[Drawing 8] It is the perspective diagram in which (a) shows circuitry drawing in the memory card form display of drawing 5 , and (b) shows the appearance.
[Drawing 9] It is a perspective diagram for explaining the configuration for a connector area of the memory card form display of drawing 5 .
[Drawing 10] It is the fundamental block diagram of the conventional electronic "still" camera.
[Drawing 11] It is the fundamental block diagram of the conventional portable telephone.
[Description of Notations]
1, 30, 47 Lens
2 Solid State Image Sensor
3 A/D Converter
4 Image-Processing Circuit
5 Coding Network
6 Decryption Circuit
7 Driver
8 Display
9 26 Internal memory
10 Memory Card
11 25 Control circuit
12, 31, 45 Release carbon button
13 50 Loudspeaker
14 44 Dial control unit
15 46 Microphone

16 27 Demodulator circuit
17 28 Control circuit
18 29 Modulation circuit
19 Receiving Circuit
20 Subcarrier Synthesizer
21 Sending Circuit
22 Common Machine
23 48 Antenna
24 Image Circuit Secured Means
32 Finder Section
34 Memory Card Form Display
35 Diffusion Panel
36 LCD
37 X Driver
38 Y Driver
39 Controller
40 Connector for Memory Cards
41 Mirror Plane Board
42 Card Kind Discernment Pin
43 Selection Circuitry

[Translation done.]